



## Meinberg Radio Clocks

Lange Wand 9  
31812 Bad Pyrmont, Germany  
Phone: +49 (5281) 9309-0  
Fax: +49 (5281) 9309-30  
<https://www.meinbergglobal.com>  
[info@meinberg.de](mailto:info@meinberg.de)

## GPS164: Satellite Receiver with integrated time code generator (DIN Mounting Rail)

Module for synchronisation by timecodes, serial telegrams or pulses.

### Important Note

This product is no longer available and may have been replaced by a newer product. We will, of course, continue to provide support for units that have already been purchased and are still in use. Please contact our [1][Sales Department](#) for further details.

This product has been discontinued and has been replaced with: [2]

### Key Features

- Programmable pulses and switching times NEW: time code or serial time string configurable for optocoupler outputs
- 2 RS-232 interfaces
- DCF77-simulation
- Modulated an un-modulated IRIG-B or AFNOR Outputs
- Included GPSANTv2 antenna uses downconverter technology to enable long transmission routes of up to 1100 m (1200 yards)
- DC-insulated antenna circuit
- Remote control and monitoring with included PC-software (COM0)
- Aluminium profile case for 35mm DIN mounting rail
- Flash-EPROM with bootstrap loader

## Description

The GPS satellite receiver is assembled in an aluminium profile case for 35mm DIN mounting rail. The integrated power supply is available as an AC (GPS164AHS) or two DC variants (GPS164DHS / 20-60 V DC and GPS164DAHS / 100-240 V DC).

The build-in time code generator provides modulated and un-modulated IRIG-B or AFNOR outputs. Additional features of the module are DC-isolated programmable pulse outputs, two RS232 interfaces and DCF77 simulation.

## Characteristics

<b>Receiver Type</b>	6 channel GPS C/A-code receiver
<b>Status Indicators</b>	Fail-LED shows that the internal timing has not been synchronized or that a system error occurred Lock-LED shows that the calculation of the position has been achieved after reset
<b>Type of Antenna</b>	Included [3] <a href="#">GPSANTv2 antenna</a> with innovative downconverter technology that allows transmission routes of up to 300 m using RG58 cable, 700 m using RG213 cable, and 1100 m using H2010 Ultraflex cable
<b>Control Elements</b>	Three LEDs to display the status of the programmable outputs one covered key (BSL) to initiate firmware update via COM0
<b>Synchronization Time</b>	Max. 1 minute in normal operating conditions Max. 25 minutes (average 12 minutes) upon first initialization or in the absence of saved satellite data
<b>Accuracy of Pulse Outputs</b>	Better than $\pm 250$ nsec after synchronization and 20 minutes of operation better than $\pm 3$ $\mu$ sec during the first 20 minutes of operation
<b>Interface</b>	Two independent serial RS232 interfaces, (optional COM1 as RS485)
<b>Serial Time String Output</b>	Baudrate: 300 to 19200 baud Framing: 7N2, 7E1, 7E2, 8E1, 8N1, 8N2 Time strings: Meinberg Standard, SAT, Uni Erlangen (NTP), NMEA0183 (RMC), Comptime
<b>DCF77 emulation</b>	Amplitude modulated 77.5 kHz sinewave carrier output level approximately -55 dBm (unmodulated)
<b>Optocoupler outputs</b>	3 optocoupler outputs; $U_{ce\_max} = 55V$ , $I_{c\_max} = 50mA$ , $P_{tot} = 150mW$ , $U_i = 5000V_{rms}$ the following operating modes are possible for each channel: <ul style="list-style-type: none"> <li>- free programmable cyclic or fixed pulses</li> <li>- timer mode; three 'ON'- and three 'OFF'-times programmable per day and channel</li> <li>- receiver state; synchronous state of the GPS-receiver is indicated</li> <li>- DCF77-emulation</li> <li>- Time code (IRIG/AFNOR)</li> <li>- Time string (time telegram of COM1)</li> </ul> The switching state of each channel can be inverted, the pulse duration is settable in steps of 10 msec from 10 msec to 10 sec. The outputs can be enabled either: <ul style="list-style-type: none"> <li>- always (immediately after reset)</li> <li>- only if receiver is GPS-synchronised</li> </ul>

<b>Supported Timecode Formats</b>	<p><b>IRIG B002:</b> 100pps, DCLS signal, no carrier, BCD time-of-year</p> <p><b>IRIG B122:</b> 100pps, AM sine wave signal, 1 kHz carrier, BCD time-of-year</p> <p><b>IRIG B003:</b> 100pps, DCLS signal, no carrier, BCD time-of-year, SBS time-of-day</p> <p><b>IRIG B123:</b> 100pps, AM sine wave signal, 1kHz carrier, BCD time-of-year, SBS time-of-day</p> <p><b>IRIG B006:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, year</p> <p><b>IRIG B126:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year</p> <p><b>IRIG B007:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, year, SBS time-of-day</p> <p><b>IRIG B127:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, year, SBS time-of-day</p> <p><b>IEEE1344:</b> Code according to IEEE1344-1995, 100pps, AM sine-wave signal, 1kHz carrier, BCD time-of-year, SBS time-of-day, IEEE1344 expansion for date, time zone, daylight saving and leap second in Control Functions segment</p> <p><b>C37.118:</b> Like IEEE1344 - with inverted sign bit for UTC offset</p> <p><b>AFNOR:</b> Code according to NFS-87500, 100pps, AM sine-wave signal, 1kHz carrier, BCD time-of-year, complete date, SBS time-of-day</p>
<b>Electrical Connectors</b>	<p>8 pole screw terminal for connecting the pulse/switch outputs and the power supply</p> <p>BNC connectors for DCF77-simulation and modulated timecode output</p> <p>female Sub-Min-D connectors for serial interfaces and unmodulated timecode outputs</p>
<b>Antenna Connector</b>	BNC connector
<b>Power Consumption</b>	ca. 5W
<b>Backup Battery Type</b>	<p>When main power supply fails, hardware clock runs free on quartz basis, almanac data is stored in RAM</p> <p>Life time of lithium battery min. 10 years</p>
<b>Operating Voltage</b>	<p>GPS164DHS: 19 ... 72VDC</p> <p>GPS164AHS: 100 ... 240VAC, 47 ... 63Hz</p> <p>GPS164DAHS: 100 ... 240VDC</p>
<b>Firmware</b>	Flash-EPROM, bootstrap loader
<b>Physical Dimensions</b>	<p>GPS164DHS: 105 mm x 85 mm x 104 mm (h x w x d) for 35mm DIN mounting rail</p> <p>GPS164AHS/GPS164DAHS: 105 mm x 125,5 mm x 104 mm (h x w x d) for 35mm DIN mounting rail</p>
<b>Supported Temperature</b>	<p>Operational: 0 - 50 °C (32 - 122 °F)</p> <p>Storage: -20 - 70 °C (-4 - 158 °F)</p>
<b>Supported Humidity</b>	Max. 85 % (non-condensing) at 40 °C
<b>Options</b>	Photo-MOS-relay-outputs; U = 400V, I = 150mA, P = 360mW Ui = 1500VAC instead of optocouplers
<b>Deployment in special environments</b>	<p>The GPS164 and its variants are already deployed to numerous customers in the power industry. They are used for electrical substation synchronization all over the world, for example in South America, the USA and Europe. This product is therefore suitable to work under harsh conditions and still provide reliable and accurate synchronization.</p>

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**RoHS Status of Product**      This product is fully RoHS-compliant.

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**WEEE Status of Product**      This product is handled as a B2B (Business to Business) category product. To ensure that the product is disposed of in a WEEE-compliant fashion, it can be returned to the manufacturer. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will bear the costs for the waste disposal itself.

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**Manual**

The English manual is available as a PDF file: [4][Download \(PDF\)](#)

**Links:**

[1] <mailto:sales@meinberg.de>

[2] <https://www.meinbergglobal.com/english/products/gps165.htm>

[3] <https://www.meinbergglobal.com/english/products/gps-antenna-converter.htm>

[4] <https://www.meinbergglobal.com/download/docs/manuals/english/164xhs.pdf>